AIRPORT SNOW PLOUGH LES

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USER MANUAL

2015-2016

This user manual applies to all snow ploughs from serial number 0891XXXXXX

MEIREN SNOW
Push your limits. Expand your boundaries.

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CE DECLARATION OF CONFORMITY

Manufacturer: **Meiren Engineering OÜ**
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11216 Tallinn
Tel +372 682 5002
www.meirensnow.com

We declare that the below mentioned product:

Airport snow plough

MEIREN SNOW LES

Model: .....

Serial number: .....

Time of construction: .....

Complies with the following directives and standards:

2006/42/EC
EN 349:1993+A1:2008

FOREWORD

Thank you for choosing the Meiren Snow product. This user manual includes technical data, user manuals and instructions on maintenance and warranty terms and conditions for LES snow ploughs. LES-series ploughs are manufactured to plough snow from runways of airports. The product is not suitable for ploughing sand, gravel, caked snow, ice and the like. Unintended use of the plough may result in financial loss and cause bodily injuries. It is therefore essential that the person using the plough reads the manual and operates the product according to the requirements. Any misuse of the product releases the manufacturer from liability with respect to reimbursement of resulting damages and costs.

GENERAL SAFETY REGULATIONS

Because the product has a complex structure and moving parts, it is essential that the person who works with the device is acquainted with all safety risks. To alleviate the risks, it is important that the

- operator has familiarized himself with the user manual for the product;
- operator has passed a relevant training course which allows him to use this type of product for work;
- operator is equipped with necessary tools and wears appropriate work clothing.

PERSONNEL

This product may be used and maintained by trained staff only. The employer of the operator is obligated to ensure that all instruction manuals and safety regulations of the manufacturer are being followed.

Before starting working with the snow plough, please be sure to read carefully the operator's manual.

1. PRODUCT DESCRIPTION

1.1. General description

LES serie ploughs are durable construction with steel frame and partially plastic snow ploughs. The plough is manufactured from high-strength steel. The product is finished with polyurethane paint that has better wear-resistance compared to conventional paints.

Snow plough blades are at an angle of 57° in relation to the road surface. To move smoothly over the obstacle, the snow plough is equipped with hydraulic impact relief valve with hydraulic accumulator. This enables the plough's mouldboard to ease when the cylinder is not in the end position to the direction of impact

LES serie snow ploughs are equipped with quick connection nozzles, which makes their installation quick and easy. In addition, it is possible to install a hydraulically adjustable support wheels.

The snow plough can be equipped with rubber or steel blades. Blades can be fixed with either standard or special wedge bolts meant for quick blade change.

1.1.1. Description of LES03

Airport snow plough LES03 is a double blade (extra equipment) plough ensuring extremely clean ploughing

result on the runways. Polyurethane cutting edge segments are maintaining uniform pressure to the surface and spare runway lightning from unnecessary wear and tear. Hydraulically operated additional blade mechanism collects effectively rest of the snow. LES03 airport snow ploughs are equipped with drop-and-drag quick hitch for easy mounting.

1.1.2. Description of LES8603

Meiren Snow airport snow plough LES 8603 is the biggest heavy duty unit in the Meiren snow plough collection. 9 meters wide snow plough has a foldable moldboard, drop and grab quick hitch and a very unique design. 28 polyethylene cutting edge segments maintain maximum contact with the surface.

Great engineering has reduced the plough weight down to 2365 kg allowing operators to spare trucks and keep high speeds on the runways. High quality, excellent features, low maintenance and purchase costs make this snow plough one of the best choices for airports around the world.

It is possible to install both rubber and steel blades on the plough. It is possible to use both regular and special wedge bolts for quick replacement of the steel blade.

	6103	**8003**	**8603**
Total width of cutting edges; mm	6100	7930	8550
Working width of blades in max turning angle; mm	4625	6080	6550
Total width; mm	6300	8130	9000
Total width in max turning angle; mm	4935	6370	6980
Total width in retracted position; mm	-	-	5790
Moldboard height, mm	1165	1165	1145/1450
Turning angle (both sides), °	40		
Angle of blades to road's surface; °	57		
Weight in standard equipment; kg	1800	1860	2340
Weight with polyurethane blades and support wheels; kg	1875	2170	2440
Weight of additional blade (with rubble blades); kg	290	390	-
Recommended hydraulic working pressure, bar	140…180	160…200	160…200
Recommended hydraulic pump output, l/min	30…50		

Table 1. Technical data for the plough

1.2. Standard equipment

1.2.1 Standard equipment set for LES03

- Pivot (2 pcs) and lifting (1 pcs) cylinder
- Hoses with quick connection nozzles
- Blade holders from polyurethane
- Support wheels with hydraulic lift
- Safety markings (reflector film) and LED marker lights
- Impact relief valve set for pivot cylinders

1.2.2 Standard equipment set for LES8603

- Pivot (4 pcs) and lifting (1 pcs) cylinders
- Hoses with quick connection nozzles
- Blade holders from polyurethane

- Hydraulic fast fitting system (lifting frame) for moldboard
- Support wheels with hydraulic lift
- Safety markings (reflector film) and LED marker lights
- Impact relief valve set for pivot cylinders

1.3. Additional equipment

- Hydraulic additional blade mechanism (only for models LES03)
- Rubber, steel or polyurethane blades
- Electrical additional valve to control the additional blade (if the vehicle is not provided with three pairs of hydraulic outlets).

NB! For the additional blade, the car needs to have three pairs of hydraulic spool valves or an additional valve for controlling the additional blade!

2. SAFETY REGULATIONS FOR WORKING WITH THE PLOUGH

2.1. Before working with the plough

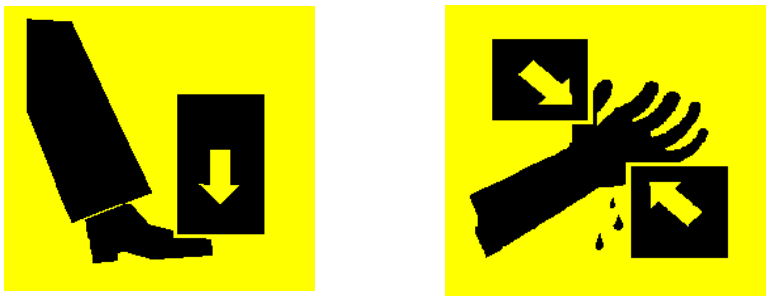
- Check the integrity and the technical condition of the plough. It is not permitted to begin work with a device that is not in technically good condition.
- Check that there are no people or objects in the vicinity that the plough may harm. The safety of people must also be ensured during maintenance and repair works and while moving the plough with the help of hydraulics or some other lifting device. In the event of failure to adhere to the safety regulations, the plough may cause injuries (there is a safety marking on the plough, see Drawing 1),
- It is prohibited to work under a lifted plough if the plough is not supported.
- Check that the plough is firmly attached to the truck and that the fastenings are not damaged.
- Check that the safety marking, position lamps (if applicable) and reflex reflectors are in order and visible.
- Check the condition of the blades. Worn-out blades must be positioned downwards, turned around or replaced, so as not to damage the blade holder.
- Do not place your hand or any other body part under the plough when adjusting the height of the blades.
- The engine of the truck may not run when adjusting the blades.
- Check the fastening wedges of the blades.
- Check the fastening pins of the levers and cylinders.
- Check that the hydraulic hoses are sound and fastened correctly.
- Check that the plough has been thoroughly lubricated.
- Check that the plough is not damaged.

2.2. Operating the snow plough

- The plough may be operated by a person who is at least 18 years old, has a driver's license for the relevant category and has familiarized oneself with the user manual for the snow plough.
- Always be aware of your surroundings and other traffic, including vehicles approaching from side roads and behind you. Be mindful of pedestrians and cyclists so that you do not put them in danger while operating the snow plough. All warning lights must be switched on while operating the snow plough!

- Observe the general traffic regulations.
- The maximum permitted working speed for the plough under normal road conditions is **60 km/h**.
- Be mindful of the road conditions: reduce speed during thaw, observe the wind direction in case of powder snow and reduce speed if necessary.
- The plough may only be used to push loose snow! It is prohibited to plough ice, frozen snowdrifts, stones, gravel, sand, etc.
- If the plough is used on uneven roads where it is possible to damage the plough, the vehicle and road surface, the responsibility falls on the operator. Damages resulting from such behavior shall not be reimbursed.
- It is not permitted to mount accessories that do not have the approval of the manufacturer on the moving parts of the plough.
- It is prohibited to use hydraulically operated devices as levers.
- The plough may only be raised from the lifting eyes.

Every time something happens during working with the plough that could damage the device, a device inspection shall be organized to establish and assess potential impairments. Damages (cracks in the structure or welding, deformed details) may danger property and people's health. It is prohibited to continue operating the device, unless the damages have been repaired.

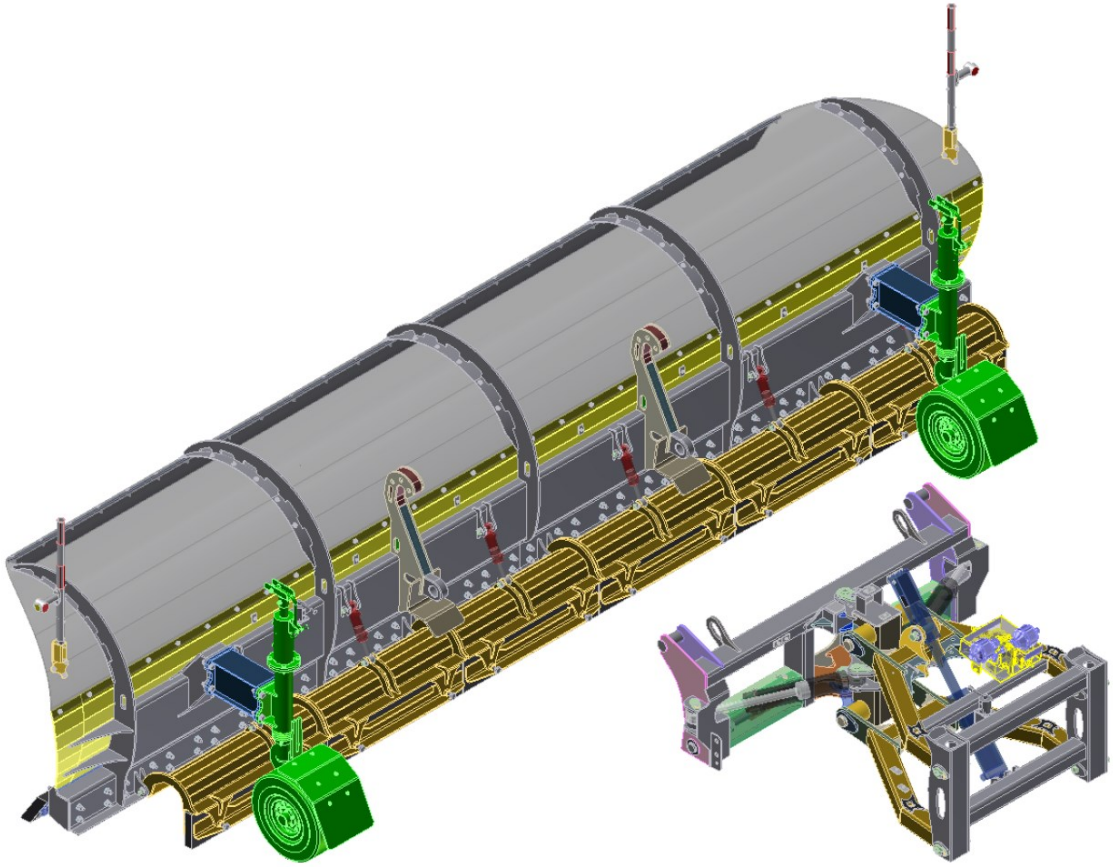


Drawing 1. Safety marking: RISK OF ACCIDENT!

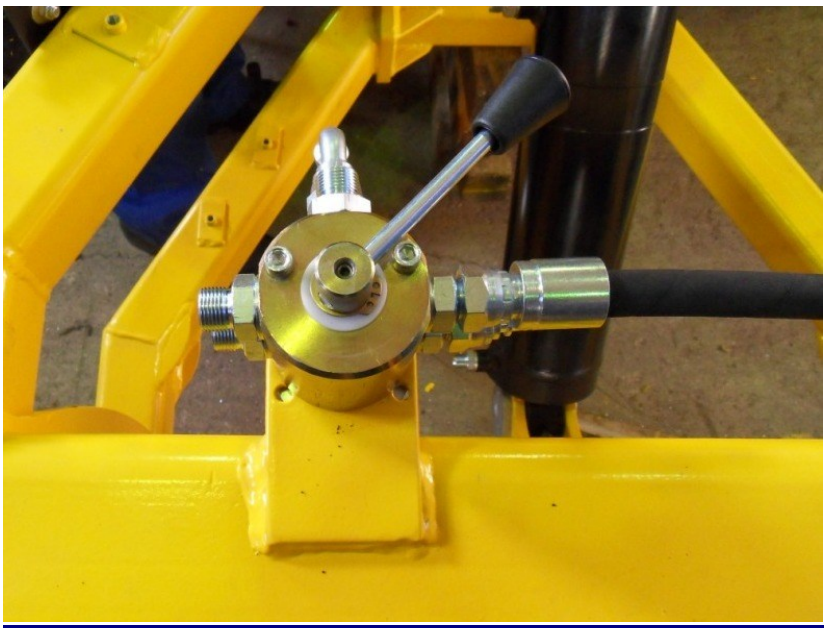
3. MOUNTING AND REMOVING THE PLOUGH

3.1. Mounting moldboard and lifting frame

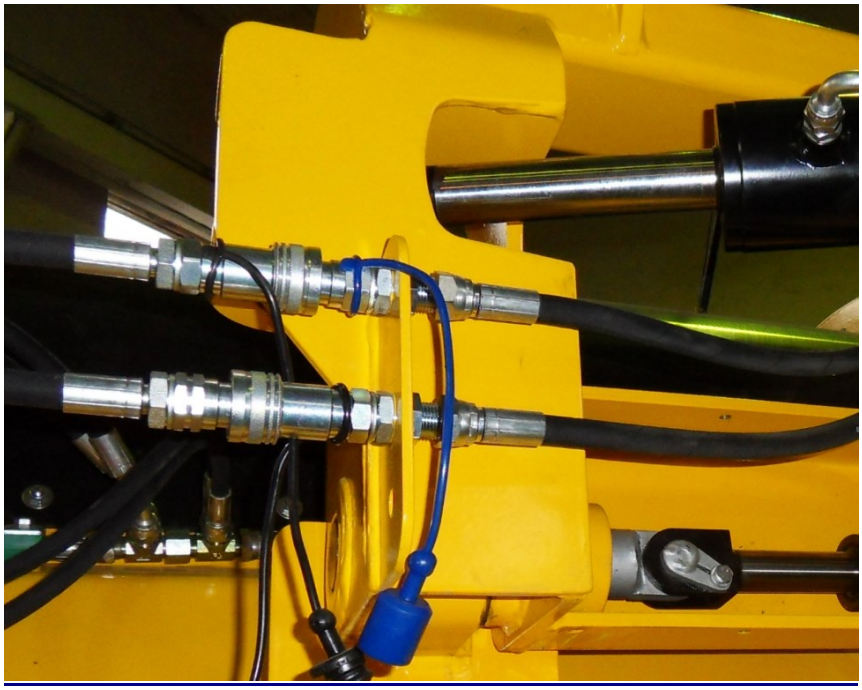
Connection between moldboard and lifting frame (look Drawing 2) is held with hydraulic locking cylinders. To unlock or lock cylinders is important to change the position of switching valve (Drawing 3). In position shown in Drawing 3 (lifted right) the locking cylinders between moldboard and lifting frame can be used. In left lifted position other hydraulic operations can be used (turning, lifting, hydraulic support wheels, ... – it depends on truck). To remove the moldbaord it's important to open also all quick connection hydraulic couplings and electrical wires between lifting frame and moldboard (Drawing 4).



Drawing 2. Lifting frame, demounted



Drawing 3. Switching valve



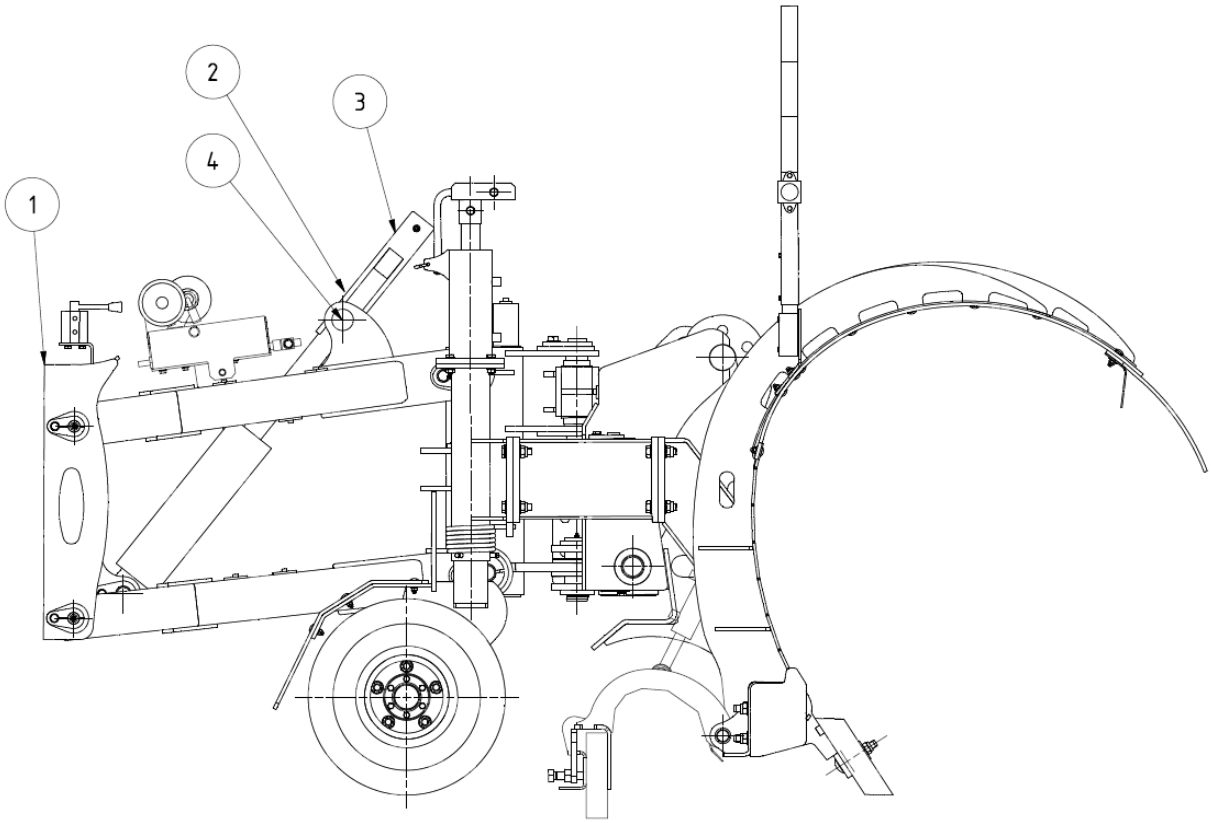
Drawing 4. Quick connection couplings

3.2. Mounting the plough to truck (Drawing 5)

- The plough must be mounted on the vehicle on even ground.
- Drive the vehicle as close to the plough as possible and connect the hydraulic hoses to the vehicle's hydraulics.
- Lift up the mounting frame (1) until mounting „earings" are over the truck's ploughplate
- Drive the vehicle's mounting plate against the mounting frame of the plough (1).
- Lift down the mounting plate of plough
- Lock all safety lockings (depending on truck).
- In case of mechanical floating – remove pin of lifting cylinder(2) and leave it to holder. Don't leave the pin attaced to cylinder during the ploughing. Pin (2) is only ment for mounting and remounting plough from truck.

3.3. Demounting the plough from the truck (Drawing 5)

- Place the plough on even ground, with the blade on the ground.
- Open plough's mounting frame (1) from truck's ploughplate
- Lift up the plough to mount back the pin (2) to noose of lifting cylinder – in case of mechanical floating
- Open hydraulic and electrical quick connection couplings and drive away



Drawing 5. Side view

4. USING THE PLOUGH

- It is essential to choose the correct working methods so as not to overload the plough. For ploughing thick and heavy snow choose the appropriate (slow) driving speed and be constantly mindful of the consistency of snow.
- While driving the plough, lift it at least 300 mm from the ground. Carefully follow the safety regulations.
- When you have finished working with the plough always support the plough on the ground.

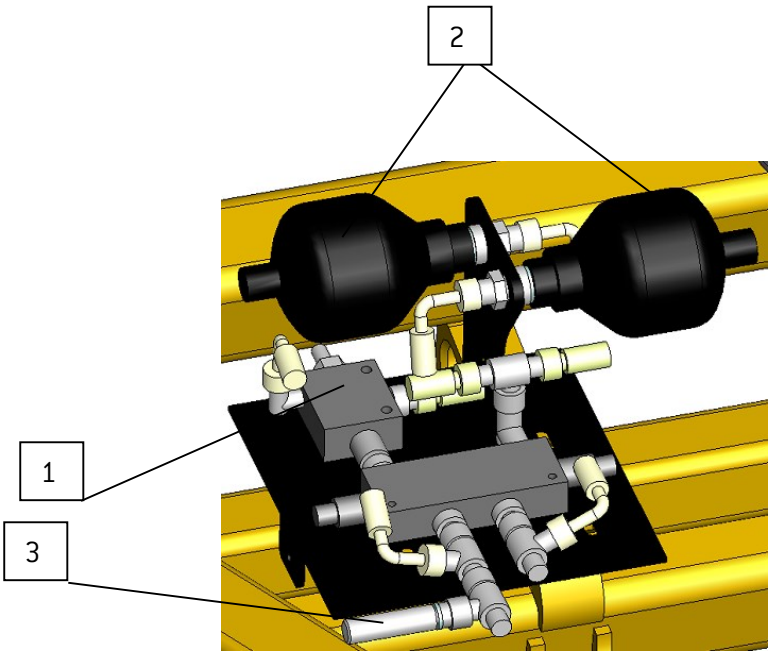
4.1. Hydraulic additional blade (LH)

LES6103 and LES8003 snow ploughs may be equipped with a hydraulic additional blade (additional equipment), which gives better and cleaner ploughing result. For installing a hydraulic additional blade (LH), the vehicle must be equipped with three distributor sections (six quick coupler parts). The capacity of the hydraulic pump must not exceed 70 l/min., since otherwise the blade will move too fast up and down. With the help of hydraulic cylinders of the additional blade it is possible to lift it up and via the pressure valve (1, drawing 6) change the pressure to the ground.

To adjust the pressure remove the valve cap and adjust the pressure with an Allen by pressing at the same time the additional blade towards the ground (or to the lower end position). The hydraulic system of the additional blade is equipped with two hydraulic batteries (2), which ensure flexibility of the additional blade in the desired pressure conditions. During adjusting you can use connection point (3) of the pressure gauge

to measure the pressure. The pressure of the blade on the ground is optimum provided the pressure in the cylinders of the additional blade is in the range of 30-40 bars.

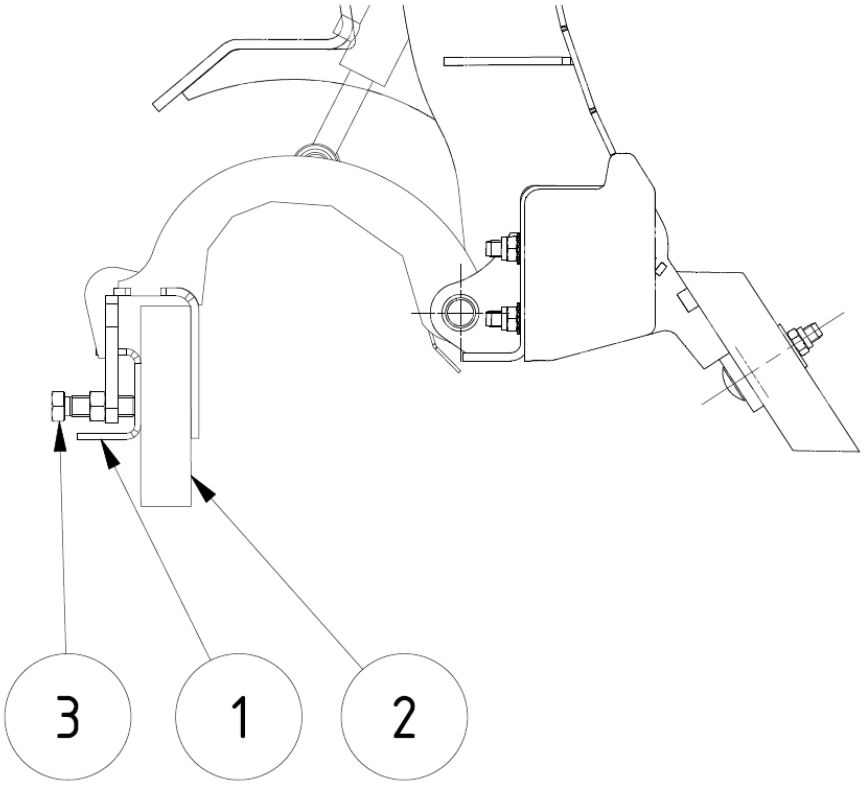
If you wish to move the total weight of the blade on the rubber blade and to lift the front blade up from the ground during work, the pressure of the cylinder of the additional blade must be adjusted to the value of approx. 50-60 bars (the factory setting is 30-40 bars).



Drawing 6. **Hydraulic unit of the additional blade**

4.2. Working with additional blade

The additional blade can be equipped with a rubber blade with the thickness of 40-50 mm and made of special rubber mix. To fasten the rubber blade the blade holder is provided with a fastening plate (1, drawing 7): the rubber sheet (2) is pressed on the fastening plate with bolts (3). When you use such fastening method there is no need to make bolt openings in the rubber blades. Compared to the products made by competitors, it takes much less time to replace the rubber blades of this type of a plough. It is also possible to lower the worn blade, which enables maximum use of the entire wearing material.



Drawing 7. Additional blade

5. SNOW PLOUGH MAINTENANCE

MAINTENANCE AFTER 8 WORKING HOURS	MAINTENANCE EFTER EVERY 150 WORKING HOURS	SEASONAL MAINTENANCE
Check all the bolt connections and hydraulic connections, tighten them if necessary.	Check all the bolt connections and hydraulic connections, tighten them if necessary.	Check all the bolt connections and hydraulic connections, tighten them if necessary.
In case of wheels, check the wheel bearing slack. In the event that there is too much slack, pull out the wheel hub, check the bearings and adjust the slack (there is a nut in the hub and a lock washer with special tabs for adjustment).	Lubricate all lubrication areas: include rotary and lifting bearings of the flap, parallelogram bearings, also the mounting frame bearing in case of confirmation from Norway and Denmark. Lubricate the adjustment mechanism in case of sliding soleplates and wheels.	Check that the hydraulic system does not have any leaks. If necessary, tighten the hydraulic fittings and hose ends.
Check that the hydraulic system does not have any leaks. If necessary, tighten the hydraulic fittings and hose ends.	Check the condition of the blades and fastenings. If necessary, adjust or replace the blades.	Spray the zinc parts, hydraulic valves and the ends of hoses of the plough with preservative wax.
Check the condition of the blades and fastenings. If necessary, adjust or replace the blades.	X	Lubricate all lubrication areas. Cover the protruding adjustment areas of the inner tube wheel mechanism and support wheels with grease or wax.

X	X	Check the snow plough visually and identify whether there are parts that need replacing.
X	X	Repair any paint damage.
X	X	Pull in the cylinder piston rod or preserve it with appropriate grease.
X	X	Let the plough be open to winds, but protect it from rain and sun.

6. PRODUCT WARRANTY TERMS AND CONDITIONS

- The seller shall give the product a warranty period of 12 (twelve) months. The warranty period shall begin when the product is transferred to the purchaser, the delivery time shall be the date specified on the instrument of delivery and receipt or the CMR consignment note.
- The warranty shall cover the elimination of discovered manufacturing, material or structural defects of the product by the seller. The seller shall be obligated to replace the defective product with a new one only if the product or its component parts cannot be repaired or the detail cannot be replaced.
- The purchaser shall agree to notify the seller in writing within 7 (seven) calendar days of becoming aware of the defect, describing the defect with sufficient accuracy.
- The seller shall be required to carry out an expert analysis to identify the causes of the defect within fourteen (14) business days after the purchaser's written notice of the warranty case. If the cause is covered by the warranty, the seller shall eliminate it within 20 (twenty) working days after the expert analysis is carried out.
- Warranty repairs shall be carried out at the shipping address specified in the order confirmation. Repair work of larger scale shall be carried out in the territory of the seller. Cost of transporting the product for warranty repair shall be paid by the purchaser. The purchaser shall cover the expenses and transport costs for repair works excluded from the warranty terms and conditions.
- Warranty shall not cover defects which are caused:
  - as a result of natural wear and tear of the product;
  - as a result of road surface characteristics or damage thereof;
  - in connection with the use of the product contrary to the technical requirements, safety regulations and intended purpose;
  - due to failure to observe the maintenance requirements of the product;
  - due to a traffic accident;
  - of which the purchaser has not notified the seller in writing within 7 (seven) days following its occurrence, and / or the purchaser has not given the seller an opportunity to determine the cause of the defect pursuant to the contract;
  - in the extent to which the increasing of the defect could have reasonably been prevented by the seller.
- Product warranty shall expire prematurely from the time when:
  - the product is repaired independently without acquiring a prior written approval from the seller;
  - the design is changed, additional equipment and / or spare parts have been installed independently without acquiring a prior written approval from the seller.
- In the event that the seller, despite repeated written appeal from the purchaser, fails to fulfill its warranty obligations under the contract, the purchaser shall have the right to repair the product at the cost of the seller. The purchaser must notify the seller in writing at least (5) five business days prior to the replacement or repair of the defective product, and provide a reasonable estimation of the expected cost.

- The purchaser may withdraw from the contract and demand the collection of the product and refund only in the event that there is a defect which cannot be repaired or a part which cannot be replaced, and the replacement of the defective product with a new product would also not give results which would allow using the product as intended.
- The warranty for the product or its part replaced during the warranty period shall cover the product or its part until the end of the general warranty period.